

# ROBINAIR

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## Operating Manual



# SMART<sup>®</sup> & CART

Automatic A/C Charging Station

For Refrigerant R-134a Systems Only!



## **Safety Precautions**

This equipment is intended for professional use only. The service technician should be familiar with proper servicing of air conditioning systems as well as the dangers and use of refrigerants and pressurized components before using the equipment.

### **⚠ WARNING ⚠**

**Always wear safety goggles when working with refrigerants.** Contact with refrigerants can cause injury.

**Connecting hoses to the wrong ports may cause personal injury or may damage the equipment.** Check the operating manual for your air conditioning system for the correct hookup.

**Disconnect hoses with extreme caution!** All hoses may contain liquid refrigerant under pressure. Contact with refrigerant can cause injury. Wear proper, personal protective equipment, including safety goggles. Point the disconnected end of a hose away from you and anyone who is nearby.

**Use only with refrigerant type R-134a!** Cross-contamination with other refrigerant types will cause severe damage to the A/C system and to service tools and equipment. Do not mix refrigerant types through a system or in the same container!

**Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat.** To remove R-134a from the A/C system, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment). If accidental system discharge occurs, ventilate work area before resuming service.

**HFC-134a service equipment or vehicle A/C systems should not be pressure tested or leak tested with compressed air.** Some mixtures of air/HFC-134a have been shown to be combustible at elevated pressures. These mixtures are potentially dangerous and may result in fire or explosion causing injury or property damage. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

**Improper use or connections may cause electrical shock hazards.** Read and follow these instructions carefully and take all necessary precautions to avoid electrical shock hazards. Before energizing circuits, be sure that all associated devices are properly grounded. Unplug the station from the power source before removing the control box.

## **Limited Warranty**

This product is warranted to be free from defects in workmanship, materials, and components for a period of one year from date of purchase. All parts and service center labor required to repair defective products covered under the warranty will be at no charge. The following restrictions apply:

1. The limited warranty applies to the original purchaser only.
2. The warranty applies to the product in normal usage situations only, as described in the Operating Manual. The product must also be serviced and maintained as specified.
3. If the product fails, it will be repaired or replaced at the option of the manufacturer.
4. Transportation charges for warranty service will be reimbursed by the factory upon verification of the warranty claim and submission of a freight bill for normal ground service. Approval from Robinair must be obtained prior to shipping to either an authorized service center or the factory.
5. Warranty service claims are subject to factory inspection for product defect(s).

6. Robinair shall not be responsible for any additional costs associated with a product failure including, but not limited to, loss of work time, loss of refrigerant, and non-authorized shipping and/or labor charges.
7. All warranty service claims must be made within the specified warranty period. Proof-of-purchase date must be supplied to the manufacturer.
8. Use of Robinair charging equipment with non-authorized refrigerants will void our warranty. Authorized refrigerants are listed on the equipment or are available through our Technical Service Department.

**This Limited Warranty does not apply if:**

- The product, or product part, is broken by accident.
- The product is misused, tampered with, or modified.
- The product is used for recharging any substance other than the specified refrigerant type.

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<b>A/C</b>	Air conditioning
<b>System</b>	The A/C system being serviced
<b>Tank</b>	The refrigerant supply tank
<b>Station</b>	The automatic A/C charging station

## **Glossary of Terms**

U.S. Patent Nos.: 4,523,897; 5,005,375; 4,688,388 RE: 33,212  
Other U.S. and Foreign Patents Pending

## Introduction

This automatic A/C charging station is designed with you in mind. It is accurate, easy to program, and simple to use.

**Before using the station,** read and understand all instructions and warnings in this operating manual.

The 220V 50Hz models have some operating exceptions, which are noted in this operating manual.

In addition, all measurements are metric and the manifold is equipped with kPa/bar gauges showing temperature in degrees Celsius.

Before operating the 220V 50Hz model, plug the short power cord from the upper control box into the outlet on the lower power box. Plug the main power cord into a 220V 50Hz power source that is free of transients and electrical noise.

## Set Up Instructions

To set up the station for operation, you need to prepare the vacuum pump and install the refrigerant tank.

### PREPARING THE VACUUM PUMP

The VacuMaster® vacuum pump is shipped without oil in the reservoir.

**Before starting the station, you must fill the pump with oil and remove the exhaust plug from the end of the pump's handle.**

*Note:* The Iso-Valve™ isolation valve on the side of the pump **must** remain open (the position shown in the illustration) for the station to operate.

**CAUTION!** Do **not** attempt to run the vacuum pump when the manifold gauge set shows pressure readings above 5 psi. In the vacuum mode, positive pressure will:

- High pressure — not allow the vacuum solenoids to open.

- Low pressure — blow oil out of the pump handle when the vacuum solenoids do open.

Running the vacuum pump with positive pressure locks high pressure between the two solenoids and prevents operation of the pump.

Follow these procedures to prepare the vacuum pump for use with the charging station.

1. Remove and discard the exhaust plug from the end of the pump's handle.
2. Remove and retain the black plug on the oil fill port.
3. Pour vacuum pump oil into the oil fill port until oil appears in the sight glass on the reservoir. The approximate oil capacity of the pump is 13 ounces (384 milliliters).
4. Close both the high side and low side valves on the station's manifold.

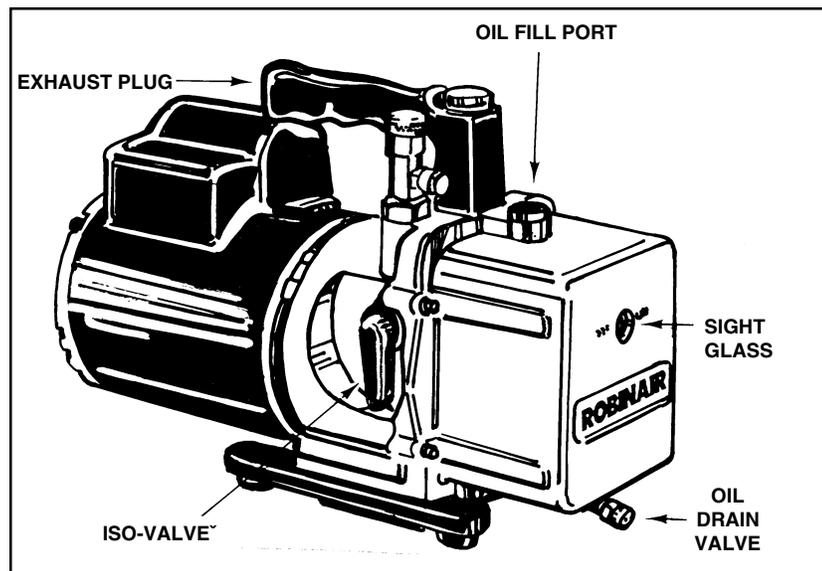


Diagram of Vacuum Pump Components

5. Plug the station into the proper voltage outlet, and turn on the MAIN POWER switch.
6. Simultaneously press the ENTER and zero keys on the keypad to access the manual diagnostic mode.
7. Press “1” on the keypad to start the pump.
8. While the pump is running, add enough vacuum pump oil so that the oil level is even with the line on the reservoir’s sight glass.
9. Press “1” or the RESET CYCLE key on the keypad to stop the pump.
10. Replace the black plug on the oil fill port.

**IMPORTANT!** For maximum performance, change the vacuum pump oil frequently (approximately after every four hours of running time). We recommend using our Premium High Vacuum Pump Oil; it is specifically blended to maintain maximum viscosity at normal running temperatures and to improve cold weather starts (see the “Replacement Parts List”).

Read and follow the detailed instructions in the Vacu-Master® Vacuum Pump Operating Manual. You do not need to return the warranty registration card contained in the Vacu-Master® Vacuum Pump Operating Manual — return only the warranty registration card attached to the station to validate your warranty.

## INSTALLING A REFRIGERANT TANK

Follow these steps to install a refrigerant tank on the charging station.

### ▲ WARNING ▲

**Always wear safety goggles when working with refrigerants.** Read and follow all warnings at the beginning of this manual before operating the unit.

**Connecting hoses to the wrong ports may cause personal injury or may damage the equipment.** Read and follow all warnings at the beginning of this manual before operating the unit.

**Use only with refrigerant type R-134a!** Cross-contamination with other refrigerant types will cause severe damage to the station and to tools and equipment. Do not mix refrigerant types through a system or in the same container!

1. Attach the station’s yellow charging hose to a full refrigerant tank, as follows:

- **Disposable** tanks — Connect the yellow hose, open the tank’s valve, and place the inverted tank (with its valve down) on the scale platform. Be sure to center the tank over the stud welding point. Use only tanks designed for use with R-134a, including Acme threads on the fittings.

(Continued)

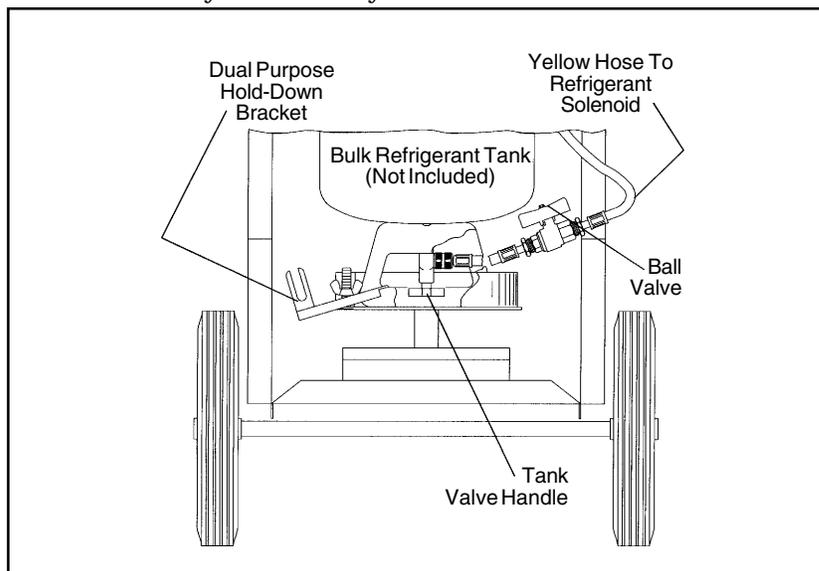


Diagram of Disposable Tank Installation

# Set Up Instructions

• **Refillable** tanks — Leave the tank upright, attach the yellow charging hose to the blue LIQUID valve on the tank, and open the blue valve.

2. Open the ball valve on the yellow charging hose (the open position runs parallel to the hose).

*Note:* Use a maximum tank size of 50 pounds (23 kilograms) with this charging station.

3. Fasten the tank securely with the tank hold-down bracket. Place the heater blanket around the center of the tank, and fasten it securely (see “Using the Heater Blanket”).
4. Secure the retaining strap around the tank.

*Note:* Adjust the strap so that it comes in contact with the tank, **but is not tight around the tank**.

5. If the tank was changed after pressing the HOLD key to interrupt the cycle, press the CONT key or RESET CYCLE key, depending on the operation you require next.

## REMOVING AN EMPTY TANK

Follow these steps to remove an empty refrigerant tank from the charging station.

1. If the station is operating, press the HOLD key. You do not need to turn off the MAIN POWER switch.

## ▲ WARNING ▲

**Disconnect hoses with extreme caution! All hoses may contain liquid refrigerant under pressure.** Read and follow all warnings at the beginning of this manual before operating the unit.

2. Disconnect the hose from the tank.
3. Release the retaining strap buckle.
4. Loosen the wing nut on the hold-down bracket and remove the empty tank from the platform.

## USING THE HEATER BLANKET

A heater blanket speeds the transfer of refrigerant and assures a complete charge by raising the pressure within the refrigerant tank.

1. Wrap the heater blanket around the refrigerant tank, secure it with the Velcro® strap, and plug its power cord into the heater outlet on the bottom of the control box (right receptacle).
2. Turn on the MAIN POWER switch on the front of the station.

The heater blanket is on whenever the station's MAIN POWER switch is on, eliminating the need for manual control. You can extend the life of the heater blanket by unplugging the heater when it's not being used or turning off the MAIN POWER switch.

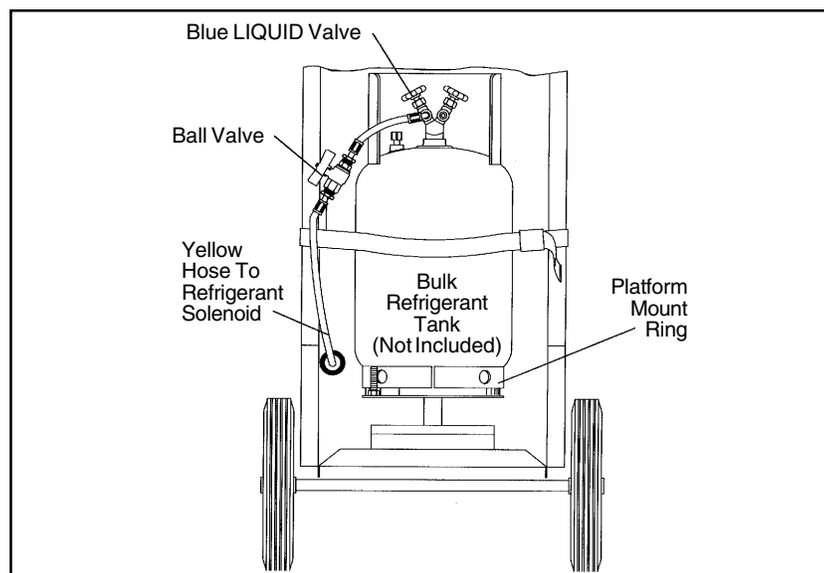


Diagram of Refillable Tank Installation

Before operating the 220V 50Hz model, plug the short power cord from the upper control box into the outlet on the lower power box. Plug the main power cord into a 220V 50Hz power source that is free from transients and electrical noise.

The chart below summarizes the steps in each of the following sections.

## TO ATTACH HOSES TO THE SYSTEM

1. Be sure all valves on the manifold are closed.

### ▲ WARNING ▲

**Connecting hoses to the wrong ports may cause personal injury or may damage the equipment.** Check your A/C system operating manual for the correct hook-up.

### Use only with refrigerant type R-134a!

Cross-contamination with other refrigerant types will cause severe damage to the station and to tools and equipment. Do not mix refrigerant types through a system or in the same container!

2. Attach the red high side hose's coupler to the high side of the A/C system.
3. Attach the blue low side hose's coupler to the low side of the A/C system.

*Note:* The manifold is ported so that the gauges indicate pressure whether or not the valves are open.

## TO DIAGNOSE SYSTEM PROBLEMS

1. Start the A/C system and watch the gauge pressures (refer to the manufacturer's specifications for proper operating pressures).
2. Perform any other visual and diagnostic inspections recommended by the manufacturer.
3. If the A/C system is operating properly, disconnect the hose couplers from the A/C system. To recharge or make necessary repairs, see the appropriate sections that follow.

## TO ADD REFRIGERANT TO PARTIALLY CHARGED SYSTEMS

1. In the program mode, press ADD .2 lbs. REFRIG. The messages "AUTOMATIC" and "REFRIGERANT" appear on the display.
2. Open the low side valve. The station dispenses .2 pounds (.1 kilograms) of refrigerant, then displays the message "CPL." Close the low side valve.
3. Monitor the A/C system operating pressures. Correct any low charge indications by pressing RESET CYCLE; repeat Step 1 as necessary.

*Note:* There are other A/C system problems which cause symptoms similar to a low refrigerant charge — refer to your operator's manual or a reliable A/C troubleshooting chart. If adding one pound of refrigerant does not correct the low charge symptoms, you may need to recover and/or recharge refrigerant, as described next.

## SUMMARY

1. Attach hoses to the A/C system.
2. Start the A/C system and compare operating pressures to manufacturer's specifications.
3. Add a partial charge, if necessary.
4. Discharge the A/C system, if required.
5. Program the vacuum/recharge cycles.
6. Start the A/C system and perform final operating check.
7. Disconnect the hoses from the A/C system.

*Summary Chart of Operating Procedures*

## Operating Procedures

### TO RECOVER REFRIGERANT

**IMPORTANT!** Use a recovery unit. Do *not* vent refrigerant to the atmosphere.

1. Be sure the A/C system is turned off, then connect the yellow hose from the manifold's center port to your recovery unit's inlet port.
2. Open the manifold's red high side valve, blue low side valve, and center valve, and start the recovery unit. Follow the recovery unit's instructions to recover refrigerant.

### TO PROGRAM VACUUM/ CHARGING CYCLE

Vacuum is programmed in minutes and refrigerant is programmed by weight. If no quantity for any particular category is required, enter zeros.

1. If the message "PROGRAM" is not displayed, press RESET CYCLE.
2. The message "VACUUM" should appear on the display. If it does not, press the REVIEW PROGRAM key repeatedly until it does.

*Note:* Follow the A/C system manufacturer's recommendations for the proper vacuum and refrigerant requirements.

3. Press the appropriate number keys until the desired vacuum time appears on the display. Enter vacuum time in whole minutes.

For example, to program 20 minutes, press two and zero — the display shows "20.00." Press ENTER and the display flashes once indicating the programmed data is accepted.

4. Press the REVIEW PROGRAM key. The message "REFRIGERANT" appears on the display. Enter the amount of refrigerant to be recharged to hundredths of a pound.

For example, to program  $2\frac{3}{4}$  pounds, press two, seven, five and ENTER. The display shows "2.75" and flashes once, indicating the programmed data is accepted. To program  $2\frac{1}{2}$  pounds, press two, five, zero and ENTER — be sure to add the last zero.

*Note:* Use the convenient conversion chart on the back cover of this manual if you need help converting ounces to hundredths of a pound.

### TO USE AUTOMATIC VACUUM/ CHARGING CYCLE

**IMPORTANT!** Before starting the vacuum pump, be sure that all A/C system pressure is discharged.

1. Close the SYSTEM DISCHARGE valve, and open the appropriate high side and/or low side valves on the station.
2. Press the START key on the keypad. The display shows the message "AUTOMATIC" followed by the message "VACUUM."
3. After a slight delay the vacuum pump starts. The display shows the amount of time programmed and begins a countdown to zero.
4. At the end of the automatic vacuum cycle, the display shows the message "HOLD." Close the high and low side valves and make sure the A/C system holds a vacuum (if it doesn't, perform any necessary repairs). Then open the high and low side valves, and press CONT to continue charging.

*Note:* Consult your A/C system service guide for the proper charging procedure.

5. During the charging cycle, the message "REFRIGERANT" appears on the display. The display shows the programmed amount of refrigerant, counts down to zero as the charging process proceeds, and indicates the end of the charging process by showing the message "CPL."
6. If the refrigerant transfer is too slow, the station emits an audible signal, the display countdown stops, and the message "CHECK REFRIGERANT" appears on the display. Press the HOLD key and close the high side valve, but leave the low side valve open. Start the A/C system, and press the CONT key to pull the remainder of the charge into the low side of the A/C system.

If the signal continues and the display does not count down, press the HOLD key and replace the tank as described in “Installing a Refrigerant Tank.” Press the CONT key to complete the automatic cycle, or press RESET to access the program mode.

7. When the automatic cycle is completed, the station beeps once, and the message “CPL” appears on the display, followed by the “HOLD” message. Press any key to access the program mode.

## TO CHECK FINAL SYSTEM OPERATION

Before disconnecting the A/C system from the station, you should check that it is operating properly.

**CAUTION!** Before starting the A/C system, be sure both valves on the station’s manifold are closed.

1. Run the A/C system until the gauge readings stabilize.

Follow these instructions to properly maintain your automatic A/C charging station. Be sure to wipe up any spills immediately and keep the station clean.

## STORING THE STATION

1. Turn off the MAIN POWER switch, and unplug the station.
2. Store the hoses on the cart, and store the couplers by connecting them to the coupler rack.
3. Close all valves when the station is not in use.

## MAINTAINING THE VACUUM PUMP

1. Check the vacuum pump oil daily, and add oil as necessary. The proper level is at the midpoint of the sight glass when the vacuum pump is running and the A/C system is under vacuum.

*Note:* Use only our Premium High Vacuum Pump Oil (see “Replacement Parts List”).

2. Compare the gauge pressure readings to the system manufacturer’s specifications.
3. Check the cool air vent discharge temperature to be sure that the system cooling is acceptable.

## TO DISCONNECT THE SYSTEM

1. Turn off the A/C system.

### ▲ WARNING ▲

**Disconnect hoses with extreme caution! All hoses may contain liquid refrigerant under pressure.** Read and follow all warnings at the beginning of this manual before operating the unit.

2. Disconnect the blue and red hose couplers from the A/C system.
3. Replace the caps on all fittings. Store the hoses on the cart, and store the couplers by connecting them to the coupler rack.

2. For maximum efficiency and longer pump life, change the vacuum pump oil frequently (approximately after every four hours of running time).

Read and follow the detailed instructions in the vacuum pump operating manual to change oil.

## CHECKING THE SCALE ACCURACY

You should routinely check the accuracy of the scale platform and calibrate the scale, if necessary, to assure that the unit charges accurately.

1. While in the PROGRAM mode, simultaneously press the ENTER and zero keys on the keypad to clear the display.
2. Press the “6” key on the keypad to display the approximate scale platform weight.
3. Remove the tank from the scale platform. The empty platform weight displayed should range from  $\pm$  two pounds. If it does not, contact the factory.

## Maintenance Instructions

### CALIBRATING THE SCALE

You should also routinely calibrate the scale, if necessary, to assure that the compressor shuts off when the tank is full. You can automatically calibrate the scale through the keypad.

#### ▲ WARNING ▲

**Proper operation of the scale is essential to safety features built into the station. If you have any questions about scale accuracy, call the factory.**

1. Press ENTER and the zero key on the keypad to access the diagnostic mode, then press 8-7-8-7. The display will show "A1."

*Note:* If you press any other key before the 8-7-8-7 sequence, you cannot enter the automatic calibration routine.

2. Be sure the scale is empty of all weight (e.g. tank). Press "0" and then press ENTER on the keypad. The display shows "0.00" and then changes to the message "A2."
3. Place a known weight (between 10 and 80 pounds) in the center of the scale platform. Enter that weight on the display using the keypad, then press ENTER. The display returns to the VACUUM mode.
4. To re-enter the diagnostics mode and verify the calibration, simultaneously press ENTER and the zero key on the keypad. Then press "6." The display shows the known weight on the scale platform.
5. Remove the known weight, and the display returns to "0.00."

### USING MANUAL DIAGNOSTICS

The station has internal and manual diagnostic modes. The internal or self-diagnostic mode checks for entries or pressures outside of normal limits and for certain electrical conditions. The manual diagnostic mode allows you to check major components for proper operation.

The station's safety features include a check valve which prevents high side pressure from entering the refrigerant tank. Also, any operating problems resulting in an error message on the display prevent operation until the problem is corrected.

#### ▲ WARNING ▲

**Be sure to discharge any system pressure before performing any manual diagnostics.**

1. If the message "PROGRAM" is not displayed, press the RESET CYCLE key.
2. Simultaneously press the ENTER and zero keys. The display should be blank except for the decimal point.
3. Press the following keys to perform these functions:

**Press "1"** — The VACUUM display segment comes on, the vacuum solenoid opens, and the pump starts. Press "1" again to turn off.

**Press "3"** — The REFRIGERANT display segment comes on and the solenoid opens. This is a momentary contact switch which turns off when released. Close the high and low side valves to perform this test.

**Press "5"** — All display segments light up. Press "5" again to turn off.

**Press "6"** — The display shows the approximate weight on the scale. See "Checking the Scale Accuracy" for diagnostic procedures.

4. Press the RESET CYCLE key to return to the program mode.

## HOW TO USE THE CONTROLS

The charging station has various components that control its operating functions.

**CAUTION!** Do *not* operate the station until you have filled the vacuum pump with oil and removed the exhaust plug from the pump's handle, as outlined in "Preparing the Vacuum Pump."

1. **SYSTEM DISCHARGE Valve** — Lets you depressurize the A/C system. Connect to a refrigerant recovery unit — do *not* vent refrigerant to the atmosphere.
2. **LOW Side Valve** — When closed, isolates the low side of the A/C system from the station controls.

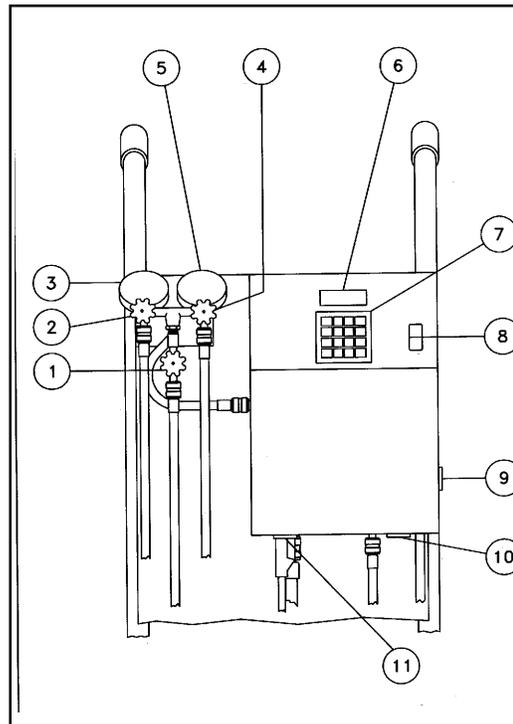
*Note:* The manifold is ported so that the gauges indicate pressure whether or not the valves are open.

3. **LOW Side Compound Gauge** — When connected to the low side of an A/C system, indicates the system's low side pressure.
4. **HIGH Side Valve** — When closed, isolates the high side of the A/C system from the station controls.
5. **HIGH Side Pressure Gauge** — When connected to the high side of an A/C system, indicates the system's high side pressure.
6. **Display** — Shows the time programmed for vacuum, the weight of refrigerant programmed for charging, the control status, and the cycle of operation. Detailed instructions for programming the display follow the next section.
7. **Keypad** — Accomplishes specific operating functions, as described in the next section.
8. **MAIN POWER Switch** — Supplies electrical power to the control panel.

9. **ACCESSORY Outlet** — Provides an electrical outlet for accessory equipment, such as a thermistor vacuum gauge. This outlet is energized when the station is plugged in, and it is located on the side of the control box.

*Note:* There is no accessory outlet on the 220V 50Hz model.

10. **HEATER Outlet** — Provides an electrical outlet for the refrigerant tank's heater blanket. This outlet is controlled by the MAIN POWER switch and is energized when the power is on.
11. **PUMP Outlet** — Provides an electrical outlet for the vacuum pump. This outlet is controlled by the logic board.



*Diagram of Control Components*

## Additional Operating Guidelines

## Additional Operating Guidelines

### USING THE KEYPAD

The charging station also has a unique keypad for data entry. It uses only six keys for sequence control, and the LCD display indicates the operating mode.

**CAUTION!** Do *not* operate the station until you have filled the vacuum pump with oil and removed the exhaust plug from the pump's handle, as outlined in "Preparing the Vacuum Pump."

**START** — Press to begin the automatic cycle after the charging station is programmed.

**CONT** — Press to resume (or continue) operations after pressing the HOLD key (described below).

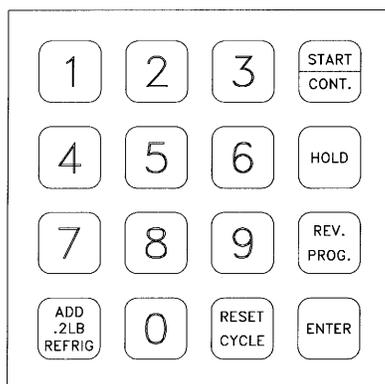
**HOLD** — Press to interrupt the automatic cycle.

**REVIEW PROGRAM** — Press to review the existing programmed data.

**ENTER** — Press to enter program data into the computer's memory.

**RESET CYCLE** — Press to access program mode.

**ADD .2 LB. REFRIG.** — Press to partially charge the A/C system.



*Diagram of Keypad*

### USING THE DISPLAY PANEL

The charging station also displays various messages on the display panel.

**CAUTION!** Do *not* operate the station until you have filled the vacuum pump with oil and removed the exhaust plug from the pump's handle, as outlined in "Preparing the Vacuum Pump."

**Segment A** — Indicates in which mode the station is operating:

**PROGRAM** — The station is in the programming mode, which allows you to program vacuum time and refrigerant weight *or* to review the existing program.

**HOLD** — The evacuation process is complete and the vacuum pump is off, *or* no refrigerant is being charged; also HOLD is used while changing a refrigerant tank or to interrupt the vacuum/charging cycles.

**AUTOMATIC** — Either the vacuum or refrigerant charging cycle is in process.

**Segment B** — Indicates the station is either evacuating the A/C system *or* charging refrigerant *or* the station is ready to be programmed for one of these two functions:

#### VACUUM

- With PROGRAM, indicates the station is ready to be programmed for evacuation.
- With AUTOMATIC, indicates the vacuum pump is running; the number displayed counts down in seconds, showing the amount of time remaining for evacuation.
- With HOLD, indicates the vacuum cycle is complete (if the display shows "0.00"), *or* if you pressed the HOLD key to interrupt the vacuum cycle, indicates the remaining time the pump runs when you press the CONT key.

## Segment B Messages

VACUUM	+ PROGRAM	= Program station for vacuum
VACUUM	+ AUTOMATIC	= Vacuum pump is running
VACUUM	+ HOLD	= Evacuation complete or interrupted vacuum cycle
REFRIGERANT	+ PROGRAM	= Program station for charge
REFRIGERANT	+ AUTOMATIC	= Station is charging A/C system
REFRIGERANT	+ HOLD	= Interrupted charging cycle

## Additional Operating Guidelines

### Quick Reference Chart

#### REFRIGERANT (POUNDS)

- With PROGRAM, indicates the station is ready to be programmed for the amount of refrigerant to be charged into the A/C system; on the keypad enter the charge in pounds (or kilograms, depending on the model you have).
- With AUTOMATIC, indicates the station is charging refrigerant into the A/C system; the number shown on the display counts down, showing the remaining amount of refrigerant to be dispensed.
- With HOLD, indicates the HOLD key was pressed to interrupt the charging cycle; the number shown on the display is the amount of refrigerant remaining to be charged into the system. To continue charging, press CONT.

Use the quick reference chart above to interpret Segment B messages.

**Segment C** — Shows a number or a coded error message on the display that indicates the station's operating status or any specific problems.

#### NUMBER

Indicates the vacuum time in minutes or the refrigerant weight in pounds (or kilograms, depending on the model you have).

#### MESSAGE CODES

- CPL — Indicates the refrigerant charging cycle is complete.
- ERR5 — Indicates an overloaded or broken scale.

**Segment D** — Indicates the transfer of refrigerant is slow or has stopped.

- **If the disposable tank is empty or the refillable tank is low**, replace the tank following the instructions in "Installing a Refrigerant Tank." A small amount of refrigerant always remains in a refillable tank.
- **If there is adequate refrigerant in the tank**, you need to pull the remainder of the programmed charge into the low side of the A/C system, as outlined in Step 7 of "To Use Automatic Vacuum/Charging Cycles."

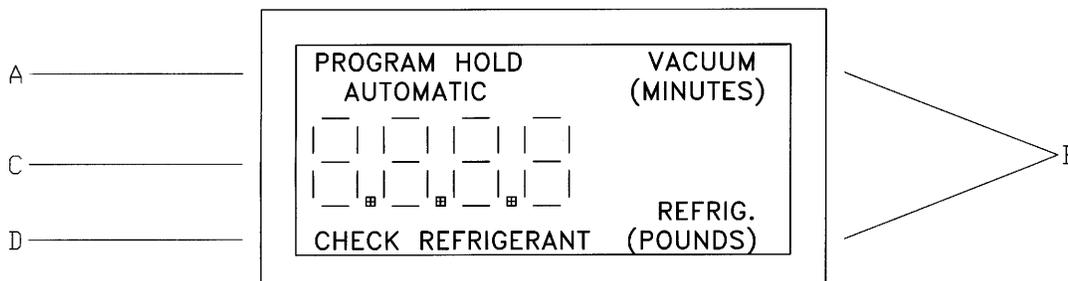


Diagram of Display Panel

## Replacement Parts List

The following is a list of replacement parts you may need to service or maintain your automatic charging station.

*Because of ongoing product improvements, we reserve the right to change design, specifications, or materials without notice.*

Our Premium High Vacuum Pump Oil is also available in handy quart containers or in convenient gallon containers:

Quart (shipped 12 quarts per case) 13203  
Gallon (shipped 4 gallons per case) 13204

This oil has been specifically blended to maintain maximum viscosity and to improve cold weather starts.

Description	115V 60 Hz	220V 50 Hz
Handle (Red)	40448	40448
Handle (Blue)	40447	40447
Gauge, Blue Low Side Compound	11741	11726
Gauge, Red High Side Pressure	11742	11727
High Side Coupler	18191	18191
Low Side Coupler	18190	18190
Vacuum Pump	RA15427	RA15428
120" Blue Hose	62120	62120
120" Red Hose	63120	63120
60" Yellow Hose	37160	37160
9" Blue Hose	37059	37059
Tank Hose	37024	37024
Black Vacuum Hose	40586	40586
Main Power Switch	RA40994	RA40994
Scale Assembly	RA19008	RA19008
Tank Platform	RA14967	RA14967
Heater Blanket	10994	45605
Vacuum Solenoid Assembly	RA19020	RA19020
Refrigerant Solenoid	RA19006	RA19006
Main Board	RA18761	RA19092
Keypad	RA18751	RA18751
Check Valve	RA17112	RA17112
Tank Strap	RA19056	RA19056
Cover	17495	17495
Wheel & Nut	RA10751	RA10751
Transformer	N/A	RA19091
High Vacuum Grease	13033	13033

## Trouble-Shooting Tips

Symptom	Cause	Cure
<i>No power when POWER switch is on — no display showing</i>	<ul style="list-style-type: none"> <li>• Station unplugged</li> <li>• No power at wall outlet</li> </ul>	<ul style="list-style-type: none"> <li>• Plug station into power source</li> <li>• Locate problem with outlet or change outlets</li> </ul>
<i>Vacuum pump does not start</i>	<ul style="list-style-type: none"> <li>• Vacuum pump unplugged</li> <li>• Vacuum time not entered</li> <li>• Defective vacuum pump</li> <li>• Faulty components</li> </ul>	<ul style="list-style-type: none"> <li>• Plug pump into power source</li> <li>• Program required vacuum time</li> <li>• Remove and replace pump</li> <li>• Call factory</li> </ul>
<i>Audible tone sounds and “CHECK REFRIG-ERANT” message displays during refrigerant transfer</i>	<ul style="list-style-type: none"> <li>• Transfer stopped or too slow</li> <li>• Tank safety strap too tight</li> <li>• Refrigerant supply empty</li> </ul>	<ul style="list-style-type: none"> <li>• Start A/C system and pull rest of refrigerant into system (Step 6 in “To Use Automatic Vacuum/Charge Cycle”)</li> <li>• Loosen the safety strap</li> <li>• Replace the refrigerant tank or call factory</li> </ul>
<i>Refrigerant doesn’t flow or “REFRIGERANT” message doesn’t display</i>	<ul style="list-style-type: none"> <li>• Refrigerant supply empty</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the refrigerant tank</li> </ul>
<i>Vacuum pump runs, but low side gauge does not register an appropriate vacuum</i>	<ul style="list-style-type: none"> <li>• Discharge valve open</li> <li>• Low side valve closed</li> <li>• Pump oil contaminated</li> <li>• Hose gasket damaged</li> <li>• Charging line loose</li> <li>• Manifold leaking</li> <li>• Pump’s Iso-valve closed</li> </ul>	<ul style="list-style-type: none"> <li>• Close discharge valve</li> <li>• Open low side valve</li> <li>• Flush and change pump oil</li> <li>• Replace gasket or hose</li> <li>• Check connections</li> <li>• Check connections</li> <li>• Open Iso-valve</li> </ul>
<i>ERR5</i>	<ul style="list-style-type: none"> <li>• Overloaded or broken scale</li> </ul>	<ul style="list-style-type: none"> <li>• Check tank weight, recalibrate if necessary, or call factory</li> </ul>

## Temperature — Pressure Relation R-134a Refrigerant

(°F)	PSI R-34a
-20	-1.8
-15	0
-10	2.0
-5	4.1
0	6.5
5	9.1
10	12.0
15	15.1
20	18.4
25	22.1
30	26.1
35	30.4
40	35.0
45	40.1
50	45.4
55	51.3
60	57.4
65	64.0
70	71.1
75	78.5
80	86.7
85	95.3
90	104.3
95	113.9
100	124.1
105	134.9
110	146.3
115	158.4
120	171.1
125	184.5
130	198.7
135	213.5
140	229.2

*Note:* Gauge pressures are approximations rounded to the nearest 1/20 PSI.

## Conversion Chart Ounces to Hundredths of a Pound

Ounce	Pound
1	.06
2	.12
3	.19
4	.25
5	.31
6	.38
7	.44
8	.50
9	.56
10	.62
11	.69
12	.75
13	.81
14	.88
15	.94
16	1.00



For assistance in servicing or using the Automatic A/C Charging Station, call the toll-free Service Line, 800-822-5561, inside the continental U.S. In Canada, call 419-485-5561, Ext. 300. In all other locations, contact your local distributor. To help us serve you better, please be prepared to provide the model number, serial number, and date of purchase.

To validate your warranty, you must complete the warranty card attached to your station and return it within ten days from date of purchase.

**SPX**

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